

[an irradiation apparatus] a chamber for irradiating said laser light to said semiconductor therein in an oxidizing atmosphere [comprising oxygen] to form a silicon oxide layer on a surface of said semiconductor, said chamber equipped with a gas intake valve and an exhaust valve; [and]

a scanning means for producing relative movement between said semiconductor on said substrate and said laser light during the irradiation of said laser light to scan said semiconductor with said laser light; and

a lens having a convex surface and a plane surface, said lens located out of said chamber,

wherein said laser light passes through said lens, and

wherein said convex surface looks toward an incident side of said laser light to said lens

while said plane surface looks toward an irradiation side of said laser light to said semiconductor.

9. (Amended) The apparatus of claim 8 wherein said [irradiation apparatus is] chamber constitutes a laser etching apparatus, a laser annealing apparatus or a laser doping apparatus.

12. (Amended) The apparatus of claim 8 wherein said laser light is introduced into said [irradiation apparatus] chamber through a window provided in a wall of said [irradiation apparatus] chamber.

13. (Amended) The apparatus of claim 8 wherein said [irradiation apparatus comprises a holder for holding said substrate therein, and said holder can be moved relative to said light] oxidizing atmosphere includes at least one gas selected from O_2 , N_2O and NO_2

21. (Amended) An apparatus for forming a silicon oxide layer on a semiconductor film formed on a substrate, comprising:

a light processing chamber means for containing said film and said substrate in an oxidizing atmosphere [comprising oxygen], said light processing chamber means having a light window on a wall of said light processing chamber means;

a laser light generating means for generating a laser light for crystallizing said semiconductor film on said substrate and forming a silicon oxide layer thereon, wherein a cross section of said laser light perpendicular to a length of said laser light has a width and a height, with said width greater than said height, said laser light generating means transmitting said laser light through said light window to irradiate said semiconductor film;

an evacuable chamber for performing a vacuum treatment therein;

a transfer means for transferring an object from said light processing chamber means to said evacuable chamber[, or] and vice-versa without exposing said object to air;

a scanning means for relatively moving said semiconductor film formed on said substrate and said laser light in a direction parallel to said height of said laser light during the irradiation of said semiconductor film with said laser light to crystallize said semiconductor film formed on said substrate and to form a silicon oxide layer on said semiconductor film, and

a lens having a convex surface and a plane surface, said lens located out of said light processing chamber means,

wherein said light processing chamber means is equipped with a gas intake valve and an exhaust valve,

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wherein said laser light passes through said lens, and
wherein said convex surface looks toward an incident side of said laser light to said lens
while said plane surface looks toward an irradiation side of said laser light to said semiconductor
film.

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55. (Amended) An apparatus for producing a semiconductor on a substrate comprising:
a laser light generating means for generating a laser light wherein a cross section of said
laser light perpendicular to a length of said laser light has a width and a height, with said width
greater than said height;

[an irradiation apparatus] a chamber for irradiating said laser light to said semiconductor
therein in [an] a nitriding atmosphere [containing nitrogen] to form a silicon nitride layer on a
surface of said semiconductor, said chamber equipped with a gas intake valve and an exhaust valve;
[and]

a scanning means for producing relative movement between said semiconductor on said
substrate and said laser light during the irradiation of said laser light to scan said semiconductor with
said laser light; and

a lens having a convex surface and a plane surface, said lens located out of said chamber,
wherein said laser light passes through said lens, and
wherein said convex surface looks toward an incident side of said laser light to said lens
while said plane surface looks toward an irradiation side of said laser light to said semiconductor.

56. (Amended) An apparatus for producing a semiconductor on a substrate comprising:
a chemical vapor deposition chamber for forming a film on a substrate by chemical vapor deposition therein;

a laser irradiation chamber for holding said film and said substrate in an oxidizing atmosphere [comprising oxygen], said laser irradiation chamber equipped with a gas intake valve and an exhaust valve;

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a laser light generating means for generating a laser light wherein a cross section of said laser light perpendicular to a length of said laser light has a width and a height, with said width greater than said height, and for irradiating said film in said oxidizing atmosphere [comprising oxygen] in said laser irradiation chamber to form an oxide layer on said film and to crystallize said film; [and]

a transferring chamber provided with transferring means and provided between said chemical vapor deposition chamber and said laser irradiation chamber, said transferring means transferring said film formed on said substrate from said chemical vapor deposition chamber to said laser irradiation chamber; and

a lens having a convex surface and a plane surface, said lens located out of said laser irradiation chamber,

wherein said laser light passes through said lens, and

wherein said convex surface looks toward an incident side of said laser light to said lens while said plane surface looks toward an irradiation side of said laser light to said semiconductor.

59. (Amended) An apparatus for producing a semiconductor on a substrate comprising:

a chemical vapor deposition chamber for forming a film on a substrate by chemical vapor deposition therein;

a laser irradiation chamber for holding said film and said substrate in [an] a nitriding atmosphere [comprising nitrogen], said laser irradiation chamber equipped with a gas intake valve and an exhaust valve;

a laser light generating means for generating a laser light wherein a cross section of said laser light perpendicular to a length of said laser light has a width and a height, with said width greater than said height, and for irradiating said film in said nitriding atmosphere [comprising nitrogen] in said laser irradiation chamber to form an nitride layer on said film and to crystallize said film; [and]

a transferring chamber provided with transferring means and provided between said chemical vapor deposition chamber and said laser irradiation chamber, said transferring means transferring said film formed on said substrate from said chemical vapor deposition chamber to said laser irradiation chamber: and

a lens having a convex surface and a plane surface, said lens located out of said laser irradiation chamber,

wherein said laser light passes through said lens, and

wherein said convex surface looks toward an incident side of said laser light to said lens while said plane surface looks toward an irradiation side of said laser light to said semiconductor.

62. (Amended) An apparatus for producing a semiconductor on a substrate comprising:

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a laser light generating means for generating a laser light wherein a cross section of said laser light perpendicular to a length of said laser light has a width and a height, with said width greater than said height;

[an irradiation apparatus] a chamber for irradiating said laser light to said semiconductor therein in [an] a nitriding atmosphere [containing nitrogen] to form a silicon nitride layer on a surface of said semiconductor, said chamber equipped with a gas intake valve and an exhaust valve;
[and]

a scanning means for producing relative movement between said semiconductor on said substrate and said laser light, in a direction parallel to said height of said laser light, during the irradiation of said laser light to scan said semiconductor with said laser light; and

a lens having a convex surface and a plane surface, said lens located out of said chamber, wherein said laser light passes through said lens, and wherein said convex surface looks toward an incident side of said laser light to said lens while said plane surface looks toward an irradiation side of said laser light to said semiconductor.

63. (Amended) An apparatus for producing a semiconductor on a substrate comprising:

a laser light generating means for generating a laser light wherein a cross section of said laser light perpendicular to a length of said laser light has a width and a height, with said width greater than said height;

[an irradiation apparatus] a chamber for irradiating said laser light to said semiconductor therein in an oxidizing atmosphere [containing oxygen] to form a silicon oxide layer on a surface of said semiconductor, said chamber equipped with a gas intake valve and an exhaust valve; [and]

a scanning means for producing relative movement between said semiconductor on said substrate and said laser light, in a direction parallel to said height of said laser light, during the irradiation of said laser light to scan said semiconductor with said laser light; and

a lens having a convex surface and a plane surface, said lens located out of said chamber,

wherein said laser light passes through said lens, and

wherein said convex surface looks toward an incident side of said laser light to said lens

while said plane surface looks toward an irradiation side of said laser light to said semiconductor.

64. (Amended) An apparatus for forming a silicon nitride layer on a semiconductor film formed on a substrate, comprising:

a light processing chamber means for containing said film and said substrate in [an] a nitriding atmosphere [comprising nitrogen], said light processing chamber means having a light window on a wall of said light processing chamber means;

a laser light generating means for generating a laser light for crystallizing said semiconductor film on said substrate and forming a silicon nitride layer thereon, wherein a cross section of said laser light perpendicular to a length of said laser light has a width and a height, with said width greater than said height, said laser light generating means transmitting said laser light through said light window to irradiate said semiconductor film;

an evacuable chamber for performing a vacuum treatment therein;
a transfer means for transferring an object from said light processing chamber means to said evacuable chamber[, or] and vice versa without exposing said object to air; [and]

scanning means for relatively moving said semiconductor film formed on said substrate and said laser light in a direction parallel to said height of said laser light during the irradiation of said semiconductor film with said laser light to crystallize said semiconductor film formed on said substrate and to form a silicon nitride layer on said semiconductor film; and

a lens having a convex surface and a plane surface, said lens located out of said light processing chamber means,

wherein said light processing chamber means is equipped with a gas intake valve and an exhaust valve,

wherein said laser light passes through said lens, and

wherein said convex surface looks toward an incident side of said laser light to said lens while said plane surface looks toward an irradiation side of said laser light to said semiconductor film.

Please add new claims 73-79 as follows:

--73. The apparatus of claim 21 wherein said oxidizing atmosphere includes at least one gas selected from O_2 , N_2O and NO_2 .

74. The apparatus of claim 55 wherein said nitriding atmosphere includes ammonia.

75. The apparatus of claim 56 wherein said oxidizing atmosphere includes at least one gas selected from O_2 , N_2O and NO_2 .

76. The apparatus of claim 59 wherein said nitriding atmosphere includes ammonia.

77. The apparatus of claim 62 wherein said nitriding atmosphere includes ammonia.

78. The apparatus of claim 63 wherein said oxidizing atmosphere includes at least one gas selected from O_2 , N_2O and NO_2 .

79. The apparatus of claim 64 wherein said nitriding atmosphere includes ammonia.--

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limit apparatus